CLAIMS

What is claimed is:

1. An optical pickup apparatus comprising:

a light source to generate and emit light;

an objective lens to converge the light emitted from the light source on an optical information storage medium;

a light path converter to convert the light emitted from the light source and light reflected from the optical information storage medium;

a collimating lens to collimate the light emitted from the light source; and

a photodetector to detect information by receiving the light reflected by the optical information storage medium and by photoelectrically transforming the received light,

wherein a phase shift coating layer is provided on at least one of the light source, the objective lens, the light path converter, and the collimating lens, to change a polarization state of the light emitted from the light source and a polarization state of the light reflected by the optical information storage medium.

2. The optical pickup apparatus of claim 1, wherein the phase shift coating layer reflects incident light beams at a same phase difference without depending on wavelengths.

3. The optical pickup apparatus of claim 1, wherein the phase shift coating layer is coated such that a phase shift corresponding to a required wavelength bandwidth is produced.

4. The optical pickup apparatus of claim 1, wherein the phase shift coating layer comprises at least 30 layers of same or different materials.

5. The optical pickup apparatus of claim 1, wherein the light path converter is a flat beam splitter.

6. The optical pickup apparatus of claim 1, wherein the light path converter is a cubic beam splitter.

7. The optical pickup apparatus of claim 1, wherein the phase shift coating layer is formed on a window of the light source.

8. An optical pickup apparatus comprising:

a light source to emit light;

a mirror to reflect the emitted light toward an optical information storage medium; and

a phase shift coating layer provided on the mirror to change a polarization state of the light emitted from the light source.

9. The optical pickup apparatus of claim 8, wherein the light emitted from the light source is linearly polarized light, and the phase shift coating layer changes the linearly polarized light to left-handed or right-handed circularly polarized light.

10. The optical pickup apparatus of claim 8, wherein the phase shift coating layer also changes a polarization state of light reflected from the optical information storage medium.

11. An optical pickup apparatus comprising:

a first light source to emit light;

light transmitting and/or reflecting units to affect the emitted light as the emitted light is transmitted and/or reflected to/from an optical information storage medium; and

a phase shift coating layer provided on at least one of the light transmitting and/or reflecting units to change a polarization state of the emitted light.

12. The optical pickup apparatus of claim 11, wherein light reflected to the light source has a different polarization state than the emitted light, so that light noise is reduced.

13. The optical pickup apparatus of claim 11, wherein the light transmitting and/or reflecting units comprise at least one of a light path converter, a collimating lens, a mirror, and an objective lens.

14. The optical pickup apparatus of claim 13, wherein the light path converter transmits or reflects the emitted light so that incident light is separated in two directions.

15. The optical pickup apparatus of claim 13, wherein the mirror reflects the emitted light toward the optical storage medium.

16. The optical pickup apparatus of claim 13, wherein the objective lens focuses the emitted light on the optical information storage medium.

17. The optical apparatus of claim 13, wherein the light transmitting and/or reflecting units further comprise a grating to divide the emitted light into zeroth-order light and $\pm 1^{st}$-order light, which have different diffraction angles and different light paths.

18. The optical apparatus of claim 11, further comprising a second light source to emit light for DVDs, wherein the light emitted from the first light source is light for CDs.

19. The optical apparatus of claim 18, further comprising a third light source to emit light for HD-DVDs.

20. The optical apparatus of claim 11, wherein the first light source comprises a twin laser diode to emit a plurality of types of light for a plurality of optical information storage media.

21. The optical apparatus of claim 11, wherein the phase shift coating layer creates a 90° phase delay between P- and S-polarized lights.